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PETROGALE BURBIDGEI (MARSUPIALIA, MACROPODIDAE), A NEW ROCK WALLABY[1] FROM KIMBERLEY, WESTERN AUSTRALIA

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and

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ABSTRACT

A new species of rock wallaby, *Petrogale burbidgei* is described from the Kimberley. It is distinguishable from other species of rock wallaby (*Petrogale* and *Peradorcas*) on the basis of external morphology and on dental measurements. Its discovery emphasises the need for a revision of the separate status of these genera.

Introduction

In historical times rock wallabies of the genus *Petrogale* have occupied steep rocky country over most of mainland Australia, excluding the greater part of Victoria, southeastern South Australia and the forested southwestern corner of Western Australia. They are also found on a number of islands off the coasts of South and Western Australia, Northern Territory and Queensland. Calaby (1971) comments that 'the highly discontinuous nature of *Petrogale* distribution has resulted in a great variation of size and colour, and the taxonomy is confused'. Although many forms have been described from tropical northern Australia (see Iredale and Troughton 1934, and Tate 1948) both Ride (1970) and Calaby (1971) consider that there are probably

[1] The suggested vernacular name is Warabi, the name used for this rock wallaby by the Wunambal-speaking people (Bobby Koodbin to I. Crawford, pers. comm.).

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only two species, the Short-eared (*P. brachyotis*) and Brush-tailed (*P. penicillata*) in the Kimberley.

In the ranges southwest of Cooktown Godman's Rock Wallaby (*P. godmani*) is found. Calaby (1971) considers that this may be only another subspecies of *P. penicillata.*

The other genus of rock wallaby, *Peradorcas*, was originally placed in *Petrogale* by Gould (1842). It was distinguished from that genus by Thomas (1904) principally on the basis that individuals have the development of supplementary molars behind M^4_4. *Peradorcas* is a monotypic genus of which three subspecies have been recognised: *P. concinna concinna*, *P. concinna monastria* and *P. concinna canescens* — these are confined to the northern Kimberley and adjacent part of the Northern Territory and northwestern Arnhem Land (Ride 1970, Calaby 1971). Tate (1948) retained the subspecific names for *Peradorcas* although he doubted their validity.

Holotype

M15830, Western Australian Museum (WAM), adult female in alcohol with skull removed, collected by Donald T. Kitchener, 2 November 1976, shot at 2000 hrs in crevice in King Leopold Sandstone in fringing vegetation at the edge of Crystal Creek, weight 1400 gm, field number 7M.37, carrying an unfurred pouch young weighing 51.0 gm.

Type locality

Crystal Creek, Mitchell Plateau, Western Australia (14°30′00″S, 125°47′20″E). Locality described in Kitchener *et al.* (in prep.).

Paratypes

Mitchell Plateau, Kimberley

M15827 (WAM); adult female; in alcohol — skull removed; collected near Surveyors Pool (14°40′30″S, 125°43′40″E) by N.L. McKenzie on 22 October 1976; shot at 2200 hrs in open low woodland dominated by *Owenia vernicosa* and *Eucalyptus* spp., *over* open low scrub, *over* hummock grass, on rugged King Leopold Sandstone; weight 1360 gm; field number WS56; carrying a furred pouch young weighing 85.0 gm.

M15832 (WAM); adult female; skeleton and 'puppet' skin; collected at Crystal Creek (14°30′00″S, 125°47′20″E) by D.J. Kitchener on 3 November 1976; shot at 2100 hrs amongst sandstone boulders; weight 1150 gm; field number 7M.44; carrying a furred pouch young weighing 77.0 gm.

Prince Regent River Reserve, Kimberley

M12402 (WAM); adult female; in alcohol — skull removed; collected 13 km NE Mt York (15°26'12", 125°36'42") by A.A. Burbidge and A. Chapman on 18 August 1974, shot at 2030 hrs on King Leopold Sandstone scree slope on the south bank of Wyulda Creek at site E4. This site is described in Miles *et al.* (1975); weight 1300 gm; field number E4/19; carrying a pouch young weighing 48.0 gm.

Bigge Island, Bonaparte Archipelago, Kimberley
(14°31'40"S, 125°09'20"E)

M5978 (WAM); adult, skull and dentaries, collected by I. Crawford on 20 September 1963.

M9312 (WAM); juvenile female; in alcohol — skull removed; collected by L.A. Smith and J. Dell on 3 June 1972; trapped; weight 480 gm; field number DAM10.

M9313 (WAM); adult male; in alcohol — skull removed; collected by A.A. Burbidge on 3 June 1972; shot about 1800 hrs; weight 1200 gm; no field number.

M9314 (WAM); subadult male; in alcohol — skull removed; collected by A.A. Burbidge on 3 June 1972; shot about 1800 hrs; weight 980 gm; no field number.

M9359 (WAM); subadult male; skeleton and flat skin (in formalin); collected by A.A. Burbidge on 3 June 1972; shot 1800 hrs; weight 920 gm; field number DAM12.

M9361 (WAM); adult female; skeleton and 'puppet' skin; collected by A.A. Burbidge on 3 June 1972; shot about 1800 hrs; weight 1400 gm; field number DAM11; carrying an unfurred pouch young weighing 18.5 gm.

M15417 (WAM); adult male; in alcohol — skull removed; collected by A.A. Burbidge and P. Fuller on 22 July 1977; shot about 2100 hrs; weight 960 gm; field number FW376.

M15418 (WAM); adult male; in alcohol — skull removed, collected by A.A. Burbidge and P. Fuller on 22 July 1977; shot about 2100 hrs; weight 1430 gm; field number FW377.

Katers Island, Bonaparte Archipelago, Kimberley
(14°28'00"S, 125°31'20"E)

M9334 (WAM); juvenile male; in alcohol — skull removed; collected by A.A. Burbidge on 9 June 1972; shot at 1800 hrs; weight 185 gm; field number 61/62.

M9335 (WAM); juvenile female; in alcohol — skull removed; collected by A.A. Burbidge on 9 June 1972; shot about 1800 hrs; weight 520 gm; field number 63/64.

M9358 (WAM); juvenile female; skeleton and 'puppet' skin; collected by J. Dell; shot; weight not recorded; field number 65/66.

M9362 (WAM); adult male; skeleton and 'puppet' skin; collected by J. Dell; shot; weight 1200 gm; field number 67/68

Boongaree Island, Bonaparte Archipelago, Kimberley
(15°04'00"S, 125°12'00"E)

M10351 (WAM); juvenile male; in alcohol — skull removed; collected by W.K. Youngson on 4 July 1973; shot; weight 750 gm; field number RM127.

McKenzie *et al.* (in prep.) report that the specimens from islands in the Bonaparte Archipelago were collected from rugged King Leopold Sandstone country with low open woodlands of *Eucalyptus* spp. and *Owenia vernicosa* over hummock grassland (*Plectrachne* spp.).

Diagnosis

Very small rock wallaby, 1-1.5 kg; with short ears (less than 35 mm long) and short hind foot (less than 93 mm long); with large, well developed, permanent premolars and four molars; without sharply contrasting pelage markings; it has a faint dark central facial, occipital and shoulder stripe, and lighter lateral facial stripes. It is distinguished from other rock wallabies of the genus *Petrogale* by its small size, inflated tympanic bullae and large ratio between length of permanent premolar and length of first molar (1.59-1.82), and from *Peradorcas* by the presence of permanent premolars.

Description

Where it is thought helpful, comparisons are drawn with *Peradorcas concinna concinna* (Gould, 1842), *P. concinna monastria* Thomas, 1926, *Petrogale brachyotis brachyotis* Gould, 1841, and *Petrogale penicillata* Griffith, Smith & Pidgeon, 1827 and *Peradorcas concinna canescens* Thomas, 1909 from Northern Territory.

Petrogale burbidgei is a very small rock wallaby. Dimensions of the skull, dentition and external body measurements are presented for *P. burbidgei* in Tables 1 and 2. Skull and dental measurements are summarised in Table 3 for adult (dental notation $M\frac{4}{-}$ 1.0) *P. burbidgei* and are listed alongside comparative measurements from adult *Peradorcas concinna*, the species most easily confused with *P. burbidgei*. All *Petrogale* (excluding *Peradorcas*,

see Remarks below) are easily separable from *P. burbidgei* on their greater size. The skull and dentary of the holotype are illustrated in Fig. 1. The notation of molar eruption stage used in Tables 1 and 2 is as follows: a tooth not erupted above the surface of the maxilla is rated at zero, while a tooth that is fully erupted is rated at 1.0. Thus if the fourth upper molar is half erupted, this would be designated as M^{4}_{-} 0.5.

(a) Skull and dental characters: *P. burbidgei* has the typical narrow rostrum and fragile posterior palatal structure of *Peradorcas* and *Petrogale*. Possibly its most pronounced cranial character is the size of the tympanic bullae mesial to the post-glenoid process. These are considerably inflated in comparison with *P. concinna*, *P. brachyotis* and *P. penicillata* (see Figs 3 & 4). The alisphenoid bullae are narrow and only slightly inflated. There is a slight crest forming the anterior border of the ovale foramen and the external lateral border of the pterygoid cavity. As with *P. concinna* and *P. brachyotis*, there is little of the petrosal emergent from the eustachian canal compared to *P. penicillata*. Both the glenoid and mastoid processes, viewed laterally, curve forward to about the same degree as *P. concinna* and more so than in the petrogales examined. The median ridge on the basioccipital is low, as with the other species examined. The nuchal crest is pronounced as it also is in *P. concinna*, and accentuates the supraoccipital depressions on either side of it. The length of the rostrum as a proportion of the length of the skull is similar to the other species examined, although the rostrum is narrower anteriorly than the other species. The incisive foramina are small and elongate with the labial foramina behind. The labial foramina are on the ridge at the edge of the palate on the premaxillary — maxillary suture. The nasals are similar in shape to *P. concinna* being hastate in outline (see Fig. 2), relatively much more expanded posteriorly than *P. penicillata* and slightly more so than *P. brachyotis*. The inferior lacrimal tuberosity is moderate as with *P. concinna* but the superior is slightly reduced relative to the other petrogales examined. The dorsal crest of the zygomatic process of the squamosal curves down only slightly as is the case with the other species examined.

The upper and lower incisors closely resemble other *Petrogale* species with $I^{1}_{-} > I^{3}_{-} > I^{2}_{-}$ and I^{3}_{-} having the typical lateral fold which divides the spade-shaped tooth into two distinct lobes. In specimen number M9334, which has M^{1}_{-} almost in place, I^{3}_{-} is only about a quarter erupted, while I^{3}_{-} is fully erupted in specimen number M9335 which has M^{2}_{-} three-quarters erupted. The milk molar DP^{4}_{-}, on the notation of Thomas (1888), is similar in shape to the upper molars and like them is similar in shape to other species examined. The forelink is very weak and the midlink is not well

Table 1: Skull and dental measurements (in mm) of *Petrogale burbidgei*.

	Holotype																
No.	M15827	M15830	M15832	M5978	M9312	M9313	M9314	M9359	M9361	M15417	M15418	M9334	M9335	M9358	M9362	M10351	M12402
Sex	♀	♀	♀	?	♀	♂	♂	♂	♀	♂	♂	♂	♀	♀	♂	♂	♀
Locality (Kimberley)	Mitchell Plateau	Mitchell Plateau	Mitchell Plateau	Bigge Island	Bigge Island	Bigge Island	Bigge Island	Bigge Island	Bigge Island	Bigge Island	Bigge Island	Katers Island	Katers Island	Katers Island	Katers Island	Boongaree Island	Prince Regent River Reserve
Molar eruption stage	$M^{\frac{4}{}}$ 1.0	$M^{\frac{4}{}}$ 0.8	$M^{\frac{4}{}}$ 0.1	$M^{\frac{4}{}}$ 1.0	$M^{\frac{2}{}}$ 0.2	$M^{\frac{4}{}}$ 1.0	$M^{\frac{3}{}}$ 0.8	$M^{\frac{3}{}}$ 0.4	$M^{\frac{4}{}}$ 1.0	$M^{\frac{4}{}}$ 1.0	$M^{\frac{4}{}}$ 1.0	$M^{\frac{1}{}}$ 0.9	$M^{\frac{2}{}}$ 0.8	$M^{\frac{2}{}}$ 0.7	$M^{\frac{4}{}}$ 1.0	$M^{\frac{2}{}}$ 1.0	$M^{\frac{4}{}}$ 0.1
Greatest length	79.9	75.5	72.3	71.8	58.5	72.5	67.1	67.2	73.1	70.4	—	49.1	59.9	61.4	75.7	67.1	71.3
Condylobasal length	69.0	67.4	63.0	62.1	49.5	63.1	58.4	57.6	64.2	61.1	—	40.2	50.8	51.9	65.3	57.4	63.1
Nasal length	33.0	30.1	29.3	29.4	20.8	29.0	26.1	—	29.4	30.2	—	14.8	22.5	24.4	32.6	27.2	27.8
Nasal breadth	15.8	14.1	13.0	13.9	9.5	14.6	11.1	—	12.9	12.7	14.3	13.0	10.2	10.4	12.5	10.0	14.7
Diastema	13.5	15.1	15.3	12.0	10.0	11.2	13.4	11.2	10.7	11.6	—	12.0	10.5	10.8	13.2	11.3	14.8
Rostrum length	35.0	34.0	31.4	31.7	23.2	31.5	28.4	27.7	31.5	29.8	—	13.9	24.4	25.9	34.6	28.2	30.3
Mastoid breadth	30.0	29.2	29.4	28.4	25.4	30.1	27.8	27.5	28.7	26.0	31.2	21.8	—	24.1	29.1	28.4	31.0
Least interorbital width	15.9	14.0	14.2	13.2	11.6	14.1	12.4	12.4	13.1	11.5	11.8	10.1	10.6	12.5	13.8	12.6	13.7
Zygomatic breadth	42.0	40.4	40.4	41.0	34.3	41.4	38.3	37.2	40.7	38.9	42.7	30.6	33.9	34.9	40.4	38.1	40.4
Ant. palatal foramen length	4.2	3.2	3.9	3.2	3.0	3.9	3.1	3.2	3.5	3.6	4.3	2.2	2.5	3.0	3.7	3.0	3.3
$P^{\frac{3}{}}$ (length x width)	—	—	—	—	4.5x2.6	—	—	4.6x2.8	—	—	—	4.2x2.7	4.2x2.6	4.8x2.9	—	4.9x2.6	—
$DP^{\frac{4}{}}$ (length x width)	—	—	—	—	4.0x3.1	—	—	3.7x3.3	—	—	—	3.8x3.2	3.8x3.4	3.9x3.3	—	4.2x3.5	—
$P^{\frac{4}{}}$ (length x posterior width)	6.1x3.1	6.7x3.1	6.4x3.2	6.0x2.6	—	6.5x2.9	6.4x3.4	—	7.0x3.2	6.2x3.0	6.7x3.2	—	—	—	6.4x3.3	—	6.2x2.9
$P^{\frac{4}{}}$ to $P^{\frac{4}{}}$ breadth (buccal surfaces)	15.4	16.2	16.2	15.5	—	15.9	16.5	—	14.4	15.2	—	—	—	—	—	—	16.5
$I^{\frac{3}{}}$ to $I^{\frac{3}{}}$ breadth (buccal surfaces)	9.3	8.9	7.8	8.6	3.0	8.7	9.1	8.1	9.1	8.7	—	7.2	7.8	8.0	8.6	8.4	8.3
$M^{\frac{1}{}}$ length	—	3.8	—	3.3	4.3	—	—	3.9	—	3.5	3.9	—	3.9	4.1	—	—	3.9

developed. X-rays of *P. burbidgei* mandibles and crania indicate that there are no supplementary molars behind M^4_4. The protolophid of $DP_{\overline{4}}$ is not well developed and the anterior cingulum is rudimentary. The lower molars are similar to other species examined.

The deciduous premolar, $P^{\underline{3}}$, of *P. burbidgei* is similar in shape to $P^{\underline{4}}$ and ranges in length from 4.2 to 4.9 mm. It is larger than those for *P. concinna* listed in Thomas (1904) and Tate (1948) and four specimens examined, none of which exceed 4.1 mm in length. $P_{\overline{3}}$ is smaller but similar in shape to $P_{\overline{4}}$.

Table 2: Body measurements (mm) of *Petrogale burbidgei*. (From specimens preserved in alcohol (A), as 'puppet' skins (P), and flat skins (F). Weights (gm) recorded in the field.)

No.	Preservation	Sex	Locality (Kimberley)	Molar eruption stage	Weight (gm)	Head and body length	Tail length	Ear length	Radius length	Tibia length	Pes length
M15827	A	♀	Mitchell Plateau	$M^{\underline{4}}$ 1.0	1360	305.5	269.3	33.0	54.5	120.2	91.0
Holotype M15830	A	♀	Mitchell Plateau	$M^{\underline{4}}$ 0.8	1400	310.0	322.0	36.0	57.9	125.5	94.5
M15832	P	♀	Mitchell Plateau	$M^{\underline{4}}$ 0.1	1150	321.0*	273.0*	32.8	—	—	87.5*
M9312	A	♀	Bigge Island	$M^{\underline{2}}$ 0.2	480	218.5	—	28.5	38.7	88.3	77.0
M9313	A	♂	Bigge Island	$M^{\underline{4}}$ 1.0	1200	309.3	277.0	31.9	53.2	113.7	90.0
M9314	A	♂	Bigge Island	$M^{\underline{3}}$ 0.8	980	277.5	271.4	32.0	48.8	107.1	82.8
M9359	F	♂	Bigge Island	$M^{\underline{3}}$ 0.4	920	307.0*	262.0*	33.0*	49.0*	105.0	81.0*
M9361	P	♀	Bigge Island	$M^{\underline{4}}$ 1.0	1400	328.0*	282.0*	33.0*	54.0*	—	90.0*
M15417	A	♂	Bigge Island	$M^{\underline{4}}$ 1.0	960	319.0	264.0	29.9	49.0	91.0	81.5
M15418	A	♂	Bigge Island	$M^{\underline{4}}$ 1.0	1430	352.7	—	32.0	58.5	121.3	92.1
M9334	A	♂	Katers Island	$M^{\underline{1}}$ 0.9	185	155.3	154.9	25.2	32.8	68.2	62.0
M9335	A	♀	Katers Island	$M^{\underline{2}}$ 0.8	520	215.1	214.5	30.8	40.9	87.2	74.2
M9358	P	♂	Katers Island	$M^{\underline{2}}$ 0.7	—	246.0	228.0	32.0*	41.0*	—	76.1
M9362	P	♂	Katers Island	$M^{\underline{4}}$ 1.0	1200	315.0*	290.0*	33.0*	62.0*	—	85.0*
M10351	A	♂	Boongaree Island	$M^{\underline{2}}$ 1.0	750	252.3	256.1	29.6	45.5	11.2	82.7
M12402	A	♀	Prince Regent R. Reserve	$M^{\underline{4}}$ 0.1	1300	289.6	251.9	35.0	54.4	—	91.9

* Field measurements

Table 3: Comparison between (a) skull and dental measurements (mm) and (b) body measurements (mm) of adult (M^4_4 fully erupted) *Petrogale burbidgei* and *P. concinna*.

(a) Skull/Dental	*P. burbidgei* (4 ♂♂, 2 ♀♀, 1?) Mean (range) N	*P. concinna* (5 ♂♂, 2 ♀♀) Mean (range) N
Greatest length	73.9 (70.4-79.9) 6	76.0 (73.2-76.9) 7
Condylobasal length	64.1 (61.0-69.0) 6	67.3 (65.0-69.0) 7
Nasal length	30.6 (29.0-33.0) 6	32.5 (30.1-35.2) 7
Nasal breadth	13.8 (12.5-15.8) 7	15.4 (13.2-19.5) 7
Diastema	12.0 (10.7-13.5) 6	16.7 (14.6-19.0) 6
Rostrum length	32.4 (29.8-35.0) 6	32.9 (31.3-34.4) 7
Mastoid breadth	29.1 (26.0-31.2) 7	30.9 (28.5-33.4) 6
Least interorbital width	13.3 (11.5-15.9) 7	11.7 (10.0-13.7) 7
Zygomatic breadth	41.0 (38.9-42.7) 7	42.7 (41.3-43.6) 7
Ant. palatal foramen length	3.8 (3.5- 4.3) 7	3.8 (3.3- 4.4) 7
$I^3\!-\!I^3$ breadth (buccal surfaces)	8.8 (8.6- 9.3) 6	9.9 (9.5-10.9) 5
(b) Body		
Weight (gm)	1258.3 (960-1430) 6	1394 (1200-1600) 5
Head and body length	321.7 (306- 353) 6	331.2 (308- 365) 5
Tail length	276.4 (264- 290) 5	305.2 (258- 335) 5
Ear length	32.1 (29.9-33.0) 6	42.7 (41.0-45.2) 5
Pes length	88.3 (81.5-92.1) 6	99.5 (95.2-105.0) 5

The sectorial permanent premolar, P^4_4, is very large in relation to the cheek teeth. $P^4\!-$ tends to be in line with the molar row. It has three vertical labial and lingual grooves that are separated by two vertical ridgelets. The posterior lingual groove is wider than the others and has a tendency to be further subdivided by a reduced vertical ridgelet. The width of $P^4\!-$ is less anteriorly than in the other petrogales examined, and the postero-lingual cusp is not so enlarged. The postero- and anterolabial cusps on $P^4\!-$ are approximately the same size. $P^4\!-$ of *P. burbidgei* is considerably longer than the five *P. concinna* teeth available for study which range from 4.3-5.0 mm (WAM, M12401, 5.0; Monash University No. 4408, 4.5; Monash No. 4409, 4.3; Monash No. 4406, 4.8; Monash No. 4407, 4.6). $P^4\!-$ ranges in length from 6.0 to 6.7 mm and is large relative to the size of the skull. The ratio of the length of $P^4\!-$ to $M^1\!-$ in *P. burbidgei* is also large compared with other species listed below:

Species	N	Mean	Range
P. burbidgei	5	1.73	1.59-1.82
P. brachyotis	8	1.33	1.36-1.58
P. penicillata	6	1.24	1.19-1.29
P. concinna	5	1.16	1.05-1.25

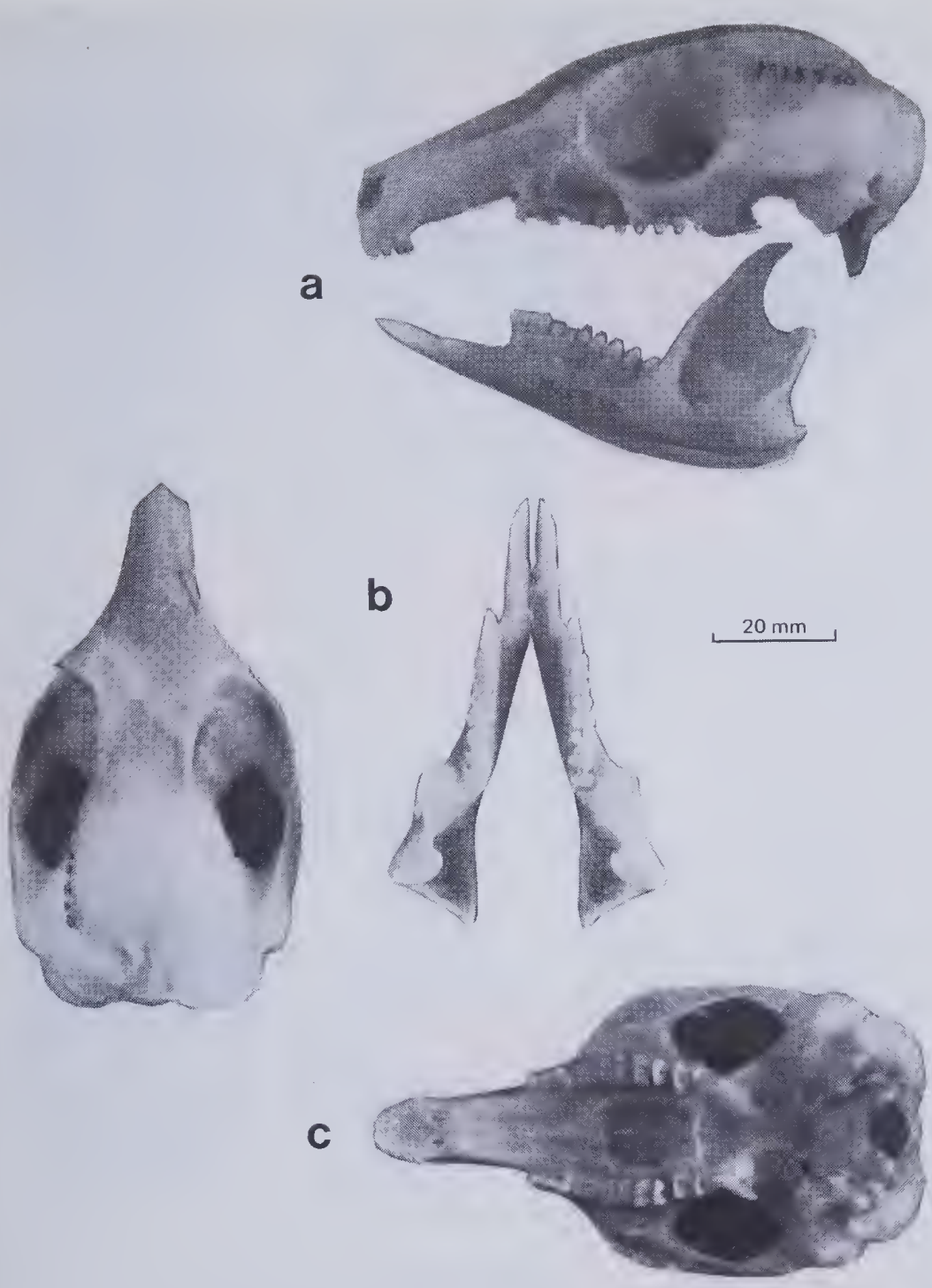

Fig. 1: Skull and dentary of the holotype (WAM M15830) of *Petrogale burbidgei* from (a) lateral, and (b) dorsal, and (c) ventral view.

Fig. 2: Dorsal view of the skull of
(a) *Peradorcas concinna monastria* (WAM M4169),
(b) *Petrogale burbidgei* sp. nov. (WAM M15832),
(c) *Petrogale penicillata* (WAM 11541), and
(d) *Petrogale brachyotis brachyotis* (WAM M15355).

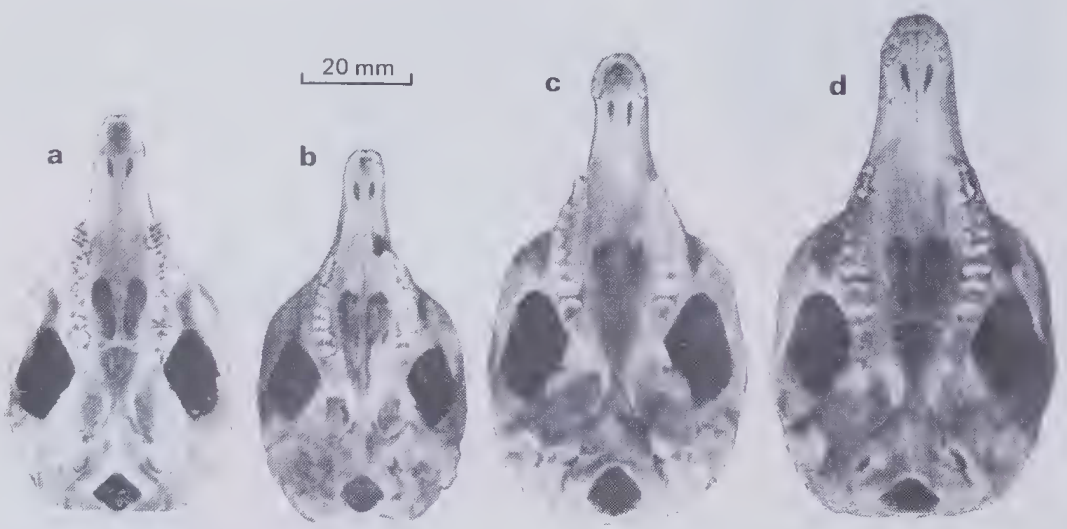

Fig. 3: Ventral view of the skull of
(a) *Peradorcas concinna monastria* (WAM M4169),
(b) *Petrogale burbidgei* sp. nov. (WAM M15832),
(c) *Petrogale penicillata* (WAM 11541), and
(d) *Petrogale brachyotis brachyotis* (WAM M15355).

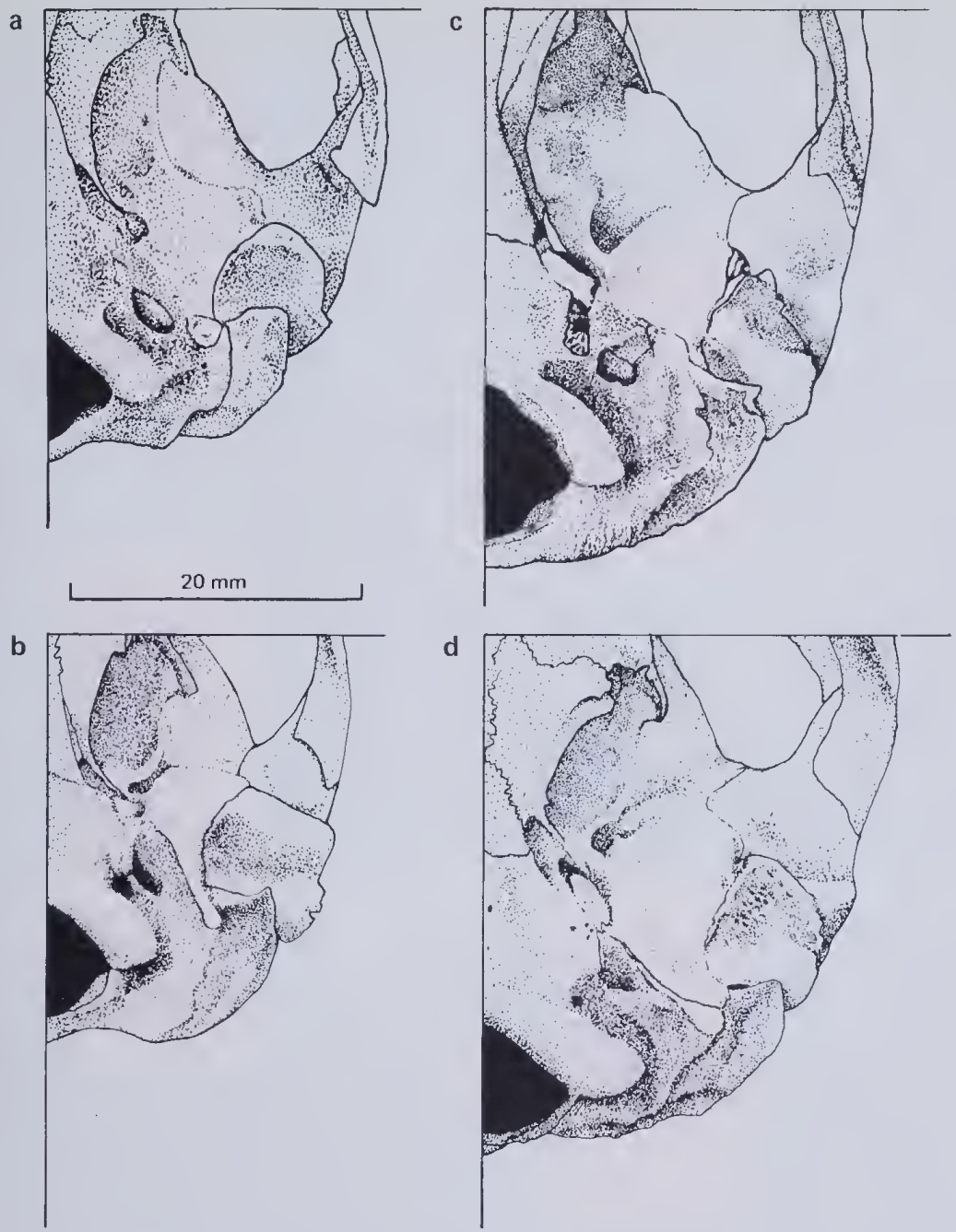

Fig. 4: Ventral view of the basicrania drawn from Fig. 3 photographs to show the region of the bulla of

(a) *Peradorcas concinna monastria* (WAM M4169),
(b) *Petrogale burbidgei* sp. nov. (WAM M15832),
(c) *Petrogale penicillata* (WAM 11541), and
(d) *Petrogale brachyotis brachyotis* (WAM M15355).

$P_{\overline{4}}$ is shorter and narrower than $P^{\underline{4}}$ and is like other petrogales. P^4_4 erupts early and in M9314 is in place before $M^{\underline{3}}$ is half erupted. Compared to the other species examined, *P. burbidgei* has dentaries which have condyles which are arcuate and more nearly anteroposteriorly aligned, incisors which are more procumbent, and the anterior border of the coronoid more nearly vertical. The length of $P_{\overline{4}}$ ranges from 5.1 to 5.8 mm and width from 1.7 to 2.2 mm. $P_{\overline{3}}$ ranges in length from 3.7 to 4.1 mm and in width from 1.8 to 2.0 mm. $DP_{\overline{4}}$ ranges in length from 3.5 to 3.8 mm and in width from 2.3 to 2.6 mm.

(b) External characters: Colours are described following Ridgway's (1912) colour code. The face is predominantly Clay with a Chamois horizontal stripe passing from the snout through the eye to the base of the ear. There is a central indistinct Light Grayish Olive facial and occipital stripe. The lips and throat are Pale Olive Buff. The rhinarium is furred above and a naked Fuscous Black in the front. The ears are Fuscous Black with a Pale Olive Buff patch behind and at the side. The neck and shoulders are Ochraceous Tawny. There is a darker patch behind the arm of Deep Neutral Gray tipped with Pale Olive Buff. The back has a Deep Olive-Buff/Ochraceous Tawny/ Fuscous Black marbling. The tail is a Light Grayish Olive, the longer hairs which form a brush on the distal one-third, are tipped with Fuscous Black. The flanks are Deep Olive Buff. The under-surface is Ivory Yellow. The arm is Chamois. The paws and feet are Light Grayish Olive with Fuscous Black under-surface. The colour at the base of the fur over much of the body is Light Neutral Gray and Neutral Gray.

Remarks

The new species has similar karyotypic and blood serum properties to *Petrogale concinna canescens* (Professor G.B. Sharman and Dr D.A. Briscoe, pers. comm.). As already pointed out it is easily confused with *P. concinna* with which it is possibly closely allied. *Peradorcas*, however, was very clearly distinguished from *Petrogale* by Thomas (1904) as 'General characters as in *Petrogale*, but the molars increased in number, seven at least on each side and probably, more, falling out in front and renewed behind as in the Manatee (*Trichechus*)' (p. 226). Pending major revisions of the two genera it would be unwise to redefine the genus *Peradorcas* to include the new species, which must therefore be placed in *Petrogale*. Another possibility is that the genus *Petrogale* should be redefined to include *Peradorcas* as an aberrant species; *P. burbidgei* could be a representative of the population from which *P. concinna* diverged.

Prior to the discovery of *P. burbidgei*, the only other rock wallabies recorded from the Kimberley Division, Western Australia, were *Peradorcas concinna concinna*, *P. concinna monastria*, *Petrogale penicillata* and *Petrogale brachyotis brachyotis*. *P. burbidgei* is not easy to distinguish from *P. concinna* in the field because they are of similar size and have similar pelage markings. The general body colour of *P. burbidgei* most obvious to an observer in the field, is Deep Olive-Buff of the dorsal pelage and the Fuscous Black furred tip to the tail. These colours contrast with those of *P. concinna concinna* and *P. concinna monastria* which have a dorsal pelage that is predominantly seen as Grayish Olive, and a tail which is shorter and has more lightly coloured hairs on its tip. *P. concinna canescens* skins examined had a much lighter coloured dorsal pelage as a result of a pronounced Cream colour flecking; the hairs on the tip of the tail are coloured and furred similarly to *P. burbidgei*. Apart from colour, *P. burbidgei* is best distinguished externally by its ears and hind feet which are considerably shorter than in *P. concinna*. The skull and dentary differences between *P. burbidgei* and *P. concinna* are marked. *P. burbidgei* has P^4_4 in place early; supplementary molars behind M^4_4 are not developed as is the case with *P. concinna*. Further P^4_4 and P^3_3 are longer and the ratio of their lengths with M^1_1 is greater in *P. burbidgei* than *P. concinna*. It may still be possible to confuse subadult *P. burbidgei* with *P. concinna* which have only P^3_- erupted and P^4_- still erupting. Excavation of P^4_- from the crypt would immediately resolve the problem. The most notable skull difference between these two species is the greater inflation of the tympanic bullae and the narrower rostrum anteriorly in *P. burbidgei*.

P. burbidgei is easily distinguished from the other two Kimberley *Petrogale* on size, pelage colour and markings, and cranial and dental characters. There are several nominal species of small *Petrogale* in the Northern Territory: *P. longmani* Thomas, 1926; *P. venustula* Thomas, 1926 and *P. wilkinsi*, Thomas, 1926. These are also easily separable from *P. burbidgei* in that they all have brightly contrasting shoulder markings and were included by Ride (1970) within *P. penicillata*. Further, the smallest of these (*P. venustula*) is larger than the *P. burbidgei* reported herein. For example, measurements of the type of *P. venustula* in Thomas (1926) show it to have a body length, tail length, hind foot, and greatest skull length some 15.9, 7.0, 7.9 and 3.9% larger than the maximum corresponding measurements for *P. burbidgei*. Further, the shape of skulls of *P. venustula* examined by us is similar to *P. brachyotis* and shows no inflation of the tympanic bullae; the ratio of P^1_- : M^1_- lengths (mean 1.42, range 1.38-1.45, N = 6) is also less than *P. burbidgei*.

An adult male *Petrogale brachyotis brachyotis* sympatric with *P. burbidgei* was shot in March 1977 at Crystal Creek, Mitchell Plateau by A. Chapman, within several hundred metres of where the holotype of *P. burbidgei* was collected. Testes preparation from this specimen were sent to Professor G. Sharman, Macquarie University, New South Wales, who is currently examining the taxonomy of rock wallabies in Australia using serological and chromosomal techniques. Professor Sharman concluded (pers. comm.) that this specimen 'is not chromosomally different, so far as can be ascertained, from *Petrogale brachyotis* from western Northern Territory, *Petrogale brachyotis signata*, *Petrogale longmani venustula* from Arnhem Land or *Petrogale longmani* from Groote Eylandt'.

The three *P. burbidgei* females collected at Mitchell Plateau between 22 October and 3 November 1976 (M15827, M15830 and M15832) had small pouch young weighing 51.0, 77.0, and 85.0 gm. The collection of a female from Prince Regent River Reserve on 18 August with a pouch young weighing 48 gm and one from Bigge Island on 3 June 1972 with a pouch young weighing 18.5 gm suggests that this species has a protracted period of births.

It was interesting to note that the expedition to the Bonaparte Archipelago reported in McKenzie *et al.* (in prep.) collected *P. burbidgei* from Bigge, Katers and Boongaree Islands, but not from Augustus or Borda Islands where they captured *Peradorcas concinna*. These authors have considered the distribution of these two species on these islands and cannot elucidate obvious differences between the islands which may account for the distribution on them of *P. burbidgei*. Their general conclusion was that *P. burbidgei* inhabits King Leopold Sandstone with an open woodland of *Owenia vernicosa* and *Eucalyptus* spp.; they were not recorded from the Warton sandstones. The Mitchell Plateau specimens came from similar habitat. *P. burbidgei* and *P. concinna* have been collected from the mainland from localities separated by distances as little as 15 km. Description of these localities (sites E2 and E4) are in Miles *et al.* (1975); they indicate that *P. burbidgei* was collected on King Leopold Sandstone (E4) which support a low open woodland of *Eucalyptus* sp. and *Owenia vernicosa*, *Ficus* and *Acacia* sp. over spinifex hummock grasses interspersed with areas of 'Sorghum type' grass. The *P. concinna* were collected from site E2 which was also King Leopold Sandstone, similarly vegetated to site E4.

In summary, the new rock wallaby, *Petrogale burbidgei*, is distinguishable from all species of rock wallaby (*Petrogale* and *Peradorcas*) on the basis of external morphology (hind foot and ear lengths) and on dental measurements. Like other *Petrogale* it does not possess supernumary molars behind

M_4^4 (as do *Peradorcas*) yet it is not distinguished from *Peradorcas* by chromosome morphology or serological characters. Its discovery emphasises the need for a revision of the separate status of these genera.

Other Material Examined

Peradorcas concinna concinna

WAM: M9286, adult female, skin and skull, Augustus Island, Kimberley; M9288 subadult female, skin and skull, Augustus Island, Kimberley; M9346 subadult female, alcohol — skull removed, Borda Island, Kimberley; M9360 subadult male, skin and skull, Borda Island, Kimberley; M12400 adult male, alcohol — skull removed, Prince Regent River Re erve, Kimberley; M12401 subadult female, alcohol — skull removed, Prince Regent River Reserve, Kimberley.

Peradorcas concinna monastria

WAM: 10444, adult female, skull only, Napier Broome Bay, Kimberley; 10445 adult male, skull only, Napier Broome Bay, Kimberley (these two specimens are topotypes and were collected by G.F. Hill in 1910; they have collector Nos 7 and 8. The holotype collected by Hill at that time had collector No. 14); M4168 adult male, skin and skull, Kalumburu, Kimberley; M4169 adult male, skin and skull, Kalumburu, Kimberley.

Peradorcas concinna canescens

C.S.I.R.O.: CM8767, adult male, skin and skull, Mt Borrodaile, N.T.; CM8768 adult male, skin and skull, Mt Borrodaile, N.T.; CM8766 subadult female, skin and skull, Mt Borrodaile, N.T.; CM8783 subadult female, skin and skull, Mt Borrodaile, N.T.

Petrogale venustula

C.S.I.R.O.: CM7012, adult male, skull, Mt Brockman Ra., N.T.; CM7015 adult male, skull, Mt Brockman Ra., N.T.; CM7082 subadult male, skull, Mt Brockman Ra., N.T.; CM7083 subadult male, skull, Mt Brockman Ra., N.T.; CM7923 subadult male, skull, Deaf Adder Creek, N.T.; CM7927 subadult female, skull, Deaf Adder Creek, N.T.; CM7933 adult female skull, Cannon Hill, N.T.; CM7935 adult male, skull, Cannon Hill, N.T.; CM7972 adult male, skull, Cannon Hill, N.T.; CM7988 adult female, skull, Nourlangie Rock, N.T.

Petrogale penicillata

(All skin and skull collected from Mungi, 13 km SE Mt Alexander, West Kimberley.)

WAM: 11539, subadult male; 11540 adult male; 11541 subadult male; 11542 adult female; 11543 subadult male; 11544 subadult male.

Petrogale brachyotis brachyotis

WAM: M11598, adult male, skin and skull, Ord River, Kimberley; M11602 adult male, skin and skull, Ord River, Kimberley; M11603 adult female, skin and skull, Ord River, Kimberley; M11641 adult female, skin and skull, Ord River, Kimberley; M12398 adult female, skin and skull, Prince Regent River Reserve, Kimberley; M14321 adult female, skin and skull, Drysdale River National Park, Kimberley; M15355 adult male, skin and skull, Mitchell Plateau, Kimberley.

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